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Biochemical and vascular aspects of pediatric chronic fatigue syndrome

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Abstract

OBJECTIVE:

To evaluate the biochemical and vascular aspects of pediatric chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME).

DESIGN:

Cross-sectional clinical study.

SETTING:

Tayside, Scotland, United Kingdom.

PARTICIPANTS:

Twenty-five children with CFS/ME and 23 healthy children recruited from throughout the United Kingdom.

INTERVENTIONS:

Participants underwent a full clinical examination to establish a diagnosis of CFS/ME and were asked to describe and score their CFS/ME symptoms. Biochemical markers were measured. Arterial wave reflection was estimated to assess systemic arterial stiffness.

MAIN OUTCOME MEASURES:

Markers of oxidative stress and free radicals, C-reactive protein level, white blood cell apoptosis, and arterial wave reflection.

RESULTS:

Children with CFS/ME had increased oxidative stress compared with control individuals (isoprostanes: 252.30 vs 215.60 pg/mL, P = .007; vitamin C, mean [SD]: 0.84 [0.26] vs 1.15 [0.28] mg/dL, P < .001; vitamin E, 8.72 [2.39] vs 10.94 [3.46] microg/mL, P = .01) and increased white blood cell apoptosis (neutrophils: 53.7% vs 35.7%, P = .005; lymphocytes: 40.1% vs 24.6%, P = .009). Arterial stiffness variables did not differ significantly between groups (mean augmentation index, -0.57% vs -0.47%, P = .09); however, the derived variables significantly correlated with total (r = 0.543, P = .02) and low-density lipoprotein (r = 0.631, P = .004) cholesterol in patients with CFS/ME but not in controls.

CONCLUSIONS:

Biomedical anomalies seen in adults with CFS/ME-increased oxidative stress and increased white blood cell apoptosis-can also be observed in children with clinically diagnosed CFS/ME compared with matched controls. Unlike in their adult counterparts, however, arterial stiffness remained within the reference range in these pediatric patients.

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